STANDARD OPERATING PROCEDURES (Revised 8/3/05)

1.0 DECONTAMINATION OF EQUIPMENT

Decontamination Procedures

All downhole soil and groundwater sampling equipment, including soil samplers (California modified, split spoon and continuous core), sampling tubes, well bailing and surging equipment, water level meters, etc., will be decontaminated using Alconox, trisodium phosphate (TSP) or an equivalent detergent solution between each borehole and between each sampling depth to eliminate cross contamination of samples. The following decontamination/rinsing procedure will be followed for all sampling equipment:

1. Submerge equipment in a water and Alconox (or equivalent) detergent solution and scrub with dedicated decontamination brushes.

2. Rinse with tap water.

3. Rinse with distilled water.

Decontaminated sample sleeves and caps will be stored on a clean polyethylene sheet or in a covered container until use. Teflon tape used to seal the sample tubes before placement of the plastic caps will be cut to size in the field and placed in a clean ziplock bags until use.

Prior to placement or use of any drilling equipment in any boring and between borings, all downhole equipment will be thoroughly decontaminated by steam-cleaning or flushing with tap water. Hollow stem augers will be steam cleaned in a decontamination trough prior to use and between boreholes. The rinsate water contained in the trough will be pumped into 55-gallon drums approved by the United States Department of Transportation (DOT) or a polyethylene holding tank and held on-site pending laboratory analysis and proper disposal.

Upon completion of field activities, all drums will be transported to a pre-determined on-site location for temporary storage. Each drum shall be clearly marked (using indelible ink) with the following information:

1. Allwest Remediation, Inc.'s Address and Phone Number.

2. Name of Client.

3. Contents: Soil or Water

4. Corresponding Boring or Well Number.

5. Date Generated.

An inventory of drums shall be provided to the facility operator to facilitate proper disposal.

2.0 SOIL SAMPLING – AUGER

Prior to commencing any soil borings, applicable permits will be obtained from the appropriate state and local agencies. Additionally, all boring locations will be delineated and Underground Service Alert will be notified a minimum of 3 working days prior to the start of field activities to allow for proper delineation of underground utilities in the vicinity of boring locations as required by law.

All motorized drilling will be conducted by a C-57 licensed well driller in accordance with State of California Water Well Standards provided in California Department of Water Resources Bulletins 74-81 and 74-90. All soil sampling will be performed under the direct supervision of a geologist registered with the State of California.

Soil boring methods include hollow stem auger boring, direct push boring, and hand auger boring. All boring locations will first be cleared to a depth of 5' bgs using a hand auger, a post-hole digger, or non-conductive probe. Regardless of the boring method used, all environmental soil sampling will be conducted in general accordance with ASTM method D1586-84, Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils. Regardless of the method of boring advancement, the top 5 feet of each boring will be advanced using a hand auger to clear the boring location of underground utilities.

Undisturbed soil samples will generally be collected at 5-foot depth intervals in brass or steel sample tubes (for hollow stem auger or hang auger methods) or acetate sleeves (for direct push methods). The bottom most portion of the soil sample (i.e. the bottom sample tube or bottom portion of the acetate sleeve) will be prepared for laboratory analysis by sealing the ends with Teflon tape and plastic end caps. The sample will then be properly labeled and stored chilled in an ice chest for delivery under chain-of-custody to a state-certified laboratory. The remainder of the sample will be placed in a sealable plastic bag and retained for lithologic description and field screening with a photo-ionization detector (PID). All sampling equipment will be decontaminated with non-phosphate detergent and double-rinsed with tap water before and after use between each sampling event.

Soil samples will be described in general accordance with the Unified Soil Classification System (USCS). Sample descriptions including grain size distribution, color, and other properties, will be recorded in a boring log for each

boring along with other pertinent information such as hammer blow counts for hollow stem auger borings, time of sample collection, etc. PID readings will be taken and recorded for each bag sample after sufficient time for volatilization has elapsed.

Soil cuttings and any decontamination water generated during boring activities will be stored onsite in DOT approved 55-gallon drums pending laboratory analysis/characterization. Once the contents are properly characterized, the drums will be transported offsite to an appropriate facility for disposal, treatment, or reuse. Borings will be backfilled with either hydrated bentonite chips or bentonite grout and finished flush with existing grade using asphalt cold patch or concrete.

3.0 USE OF PPE

If VOC emissions exceeding 50 ppmv are detected in the breathing zone of site workers during grading and construction activities, the affected workers will be requested to don half-face respirators. If VOC emissions exceeding 1,000 ppmv are detected in the breathing zone of site workers, they will be directed to leave the area until the VOC emissions are suppressed or dissipate. PPE may include the following items: Steel-toe boots, Tyvek coveralls, nitrile gloves, half-face respirators, etc.

4.0 CONFIRMATION SOIL SAMPLING

In addition to field techniques to identify and segregate impacted soils, confirmation soil samples shall be collected from the sidewalls of the limits of the upper five feet of soil removal activities and submitted for analysis. Confirmation samples will be collected at 20-foot intervals between 0 and 5 feet bgs and at the. In trenches, one confirmation samples will be collected every 20 feet along the trench.

5.0 WATER SAMPLING

- If there is little historical information for groundwater wells at a site (ask Project Manager if in doubt) utilize interface probe on all wells to check for free product. Gauge all wells.

- If free product is detected, try to collect the product using a bailer and put it in a glass jar. If product has never been detected at the well before, proceed with normal purge and sample procedures. The future protocal for wells containing free product will be conducted on a case-by-case basis.

- Gauge all on-site wells and the off-site wells to be sampled prior to purging

- Use gauging data to calculate purge volume and 80% recharge level. These calculations are:

Purge Volume: 3 * Well Volume

Well Volume: (Total Depth – Static water level) * 0.652 (4" diameter wells)

Well Volume: (Total Depth – Static water level) * 0.163 (2" diameter wells)

80% Recharge depth: -[Total Depth-Static water level) * 0.8) – Total Depth]

- Lower pump to a depth two (2) feet above the bottom of the well.
- Collect turbidity, pH, conductivity, and temperature measurements from first water drawn out of well.
- Collect turbidity, pH, conductivity, and temperature measurements until stabilization has occurred. Stabilization occurs when there is less than 10% deviation for all parameters between measurements with a minimum of 5 minutes between measurements. All lines of a purge log do not necessarily need to be filled out, and these measurements do not necessarily need to be taken at regular intervals during purging activity. For example, after the initial measurement, one could begin taking measurements 10 minutes prior to the anticipated end of purging and check for parameter stabilization. A minimum of 3 measurements are needed: the initial measurement at the beginning of the purge, and two others a minimum of 5 minutes apart to show stabilization has been reached.
- If well runs dry, sample when well has reached 80% recharge or after 2.5 hours have expired.
- If well has not run dry, prior to collecting a sample check for 80% recharge. Do not sample until the 80% recharge depth has been reached, or after 2.5 hours have expired.
- Historical work may show that wells do not recharge within the 2.5 hour time limit. If this has been demonstrated, obtain samples prior to purging. Continue with the purging process and take sample, if possible, according to this protocol. The Project Manager should be consulted regarding weather to submit the sample obtained prior to purging for laboratory analysis.
- If pump is still in the well, samples may be obtained from the sample port. If pump is not in well, samples are to be taken utilizing a new disposable tephlon bailer. Bailers should be discarded after samples are collected, such that new bailers are used at different wells. The bailer should be lowered with a new section of twine between wells to prevent cross-contamination. Lower bailers slowly to avoid agitating the water within the well.
- When sampling with the bailer make every effort not to touch the sample tip to prevent potential contamination.

- Samples taken for analysis via EPA Method 8015, 8021, or 8260 should be collected in three (3) VOC vials with no headspace (no air bubbles). EPA Method 8015/8021 requires three (3) vials and EPA Method 8260 also requires three (3) vials with no headspace. Prior to sampling the vials should have a drop of 50%HCl solution as preservative (when ordering ask lab to include preservative). Label "Preservative: HCl" on these vials to show they contain preservative.

- Samples taken for analysis via EPA Method 8270 (SVOCs) should be taken in a dark amber 1-Liter glass jar.

- Samples taken for analysis via EPA 7000 Metal series should be taken in two-250 mL plastic container with a few drops of nitric acid preservative (again, when ordering ask lab to include preservative). These samples should be filtered utilizing disposable 0.45-micron filters prior to collection in the plastic containers. Do not have the laboratories filter samples.

- Samples taken for methane analysis in groundwater should be taken in one (1) VOC vial with NO preservative (order as such from laboratory). Label vials "No Preservative".

- All samples should be labeled with the well name/number, job number and name, date, tests to be run, and time of collection. Samples should then be placed in a plastic bag designated with the well name/number. Try to minimize time samples are in sun and/or temperature extremes.

- Samples are to be placed in a cooler that has a temperature of approximately 4 degrees C (cooler with at least 25% of its volume filled with blue ice).

- For any site, collect Equipment Blanks by running DI water (NOT water from steam cleaner) over pump and collecting water in VOA vial with a drop of 50% HCl solution as a preservative. These samples should be analyzed for EPA Method 8260. This should be done each day sampling. Log and treat samples as if they were collected from a well.

- For any site, collect Trip Blanks by filling two VOA vials with de-ionized water. Log and treat samples as if they were collected from a well, making sure there is a drop of 50% HCl solution as a preservative in the VOA vial prior to collection and analyzing the sample for VOCs via EPA Method 8260.

- Pump, cable, and piping to be steam cleaned prior to initial use, between wells, and at the end of each workday. DO NOT sample while generator is in use.

- This plan is generic in nature. Different sites will have their own deviations from this general plan. Site-specific differences will be detailed in a different

form. If there are any questions regarding deviation from this plan contact the Project Manager.

6.0 FIELD LOGS

All field activities will be recorded in a field logbook. The logbook will contain observations and field measurements, personnel onsite, equipment arrival and departure times, and other vital project information. Logbooks will be bound with consecutively numbered pages. All entries will be legibly written in ink and signed by the individual making the entry. Language will be factual, objective, and free from personal opinions or other terminology that may be inappropriate. Errors will be corrected by strike-outs and entering the correct information. All corrections will be signed and dated.

Non-hazardous Waste Manifest Forms will be used to track the movement of impacted soil from the site to an appropriate facility. At a minimum, the forms will include the characterization and quantity of soil as well as the name and address of the generator, transporter, and accepting facility. Chain-of-Custody forms will be used to track the movement of analytical samples from the site to a state-certified laboratory for analysis. At a minimum, the Chain-of-Custody forms will include the following information: Sample identification, signature of sampler, date and time of collection, number and type of container, inclusive dates of possession, signature of receiver, and analyses requested.

7.0 SAMPLE LABELING

7.1 Sample Designation

1. Field sampling personnel are responsible for describing, documenting, labeling, packaging, storing, handling, and shipping samples obtained in the field so that all samples can be readily identified. These practices are necessary to ensure the integrity of the sample from collection to data reporting.

7.2 Sample Labels

1. Sample labels and identity are of critical importance in the collection of samples. All information provided for a sample is keyed to its unique sample designation. This designation, shown on all sample containers and associated field data forms, is used for data recall from the database system.

2. Field personnel will attach a label to each sample container either before or immediately after filing each container. IT is the responsibility of the field sample team leader to maintain a supply of sample labels at the site. The sample label must contain all of the following:

- The project name and number
- A unique sample designation
- The date and time sample was collected.
- Designation of the sample as a composite, if appropriate.
- Identification of preservatives used.
- Any remarks as needed.
- Sampler's name or initials.

3. The sample labels will be placed on the sample containers so not to obscure any QA/QC data on the containers such as bottle-lot code numbers. Samples information must be printed in a legible manner using indelible ink. The label must contain sufficient information so that the sample can be identified on the sample information form or collection log.

4. All QC samples, including collocated or duplicate samples and sample blanks, shall be identified using the same information as that used for regular sample identification, but in a manner that does not readily identify those QC samples. This information will be recorded in the sample collection log.

7.3 Sample Identification

1. To ensure correct identification of the sample collected, a unique alphanumeric code will be assigned to each sample, as follows:

   - Letter codes will identify the sample type. Example include:

     SE -*Sediment sample*
     S -Soil sample
     SS -Surface soil sample
     MW -Monitoring well sample
     SW -Surface water sample
     RS -Radiological sample

   - The sample code shall be followed by a unique location number, as appropriate.

7.4 Quality Assurance/Quality Control Sample Type and Number

1. Field QC check samples may include field rinsate, field blank, trip blank, and duplicate (collocated) samples. These will be identified in the same manner as described above.

8.0 SAMPLE PACKAGING AND SHIPPING

1. The procedures listed below are concerned with the proper packaging and shipment of samples to minimize the potential for sample breakage, leakage

2. and cross contamination and to provide a clear record of sample custody form collection to analysis. The EPA Resource Conservation Recovery Act (RCRA) regulations (40 Code of Federal Regulations [CFR], Section 261.[d]) specify that samples pf solid waste, water, soil or air, collected for the purpose of testing, are exempt from regulation when the following conditions apply:

    - Samples are being transported to a laboratory for analysis.
    - Samples are being transported from the laboratory to the collector after analysis.
    - Samples are being stored (1) by the collector prior to analysis; or (3) by the analytical laboratory after testing but prior to return sample to the collector or pending the conclusion of a court case.

3. The field sampling coordinator shall be responsible for the enactment and completion of the Chain-of-Custody records and the packaging and shipping requirements outlined as follows and in project-specific sampling plans. Samples must be:
    - Packaged so that they do not leak, break or vaporize. Waste samples should not be containerized with environmental samples to minimize chances of cross contamination.
    - Properly identified and each shipment or transfer must be accompanied by a Chain-of-Custody record.
    - Clearly labeled immediately upon collection. Each sample bottle should include the following information:
        - The project name and number.
        - A unique sample designation.
        - The date and time sample was collected.
        - Designation of the sample as a composite, if appropriate.
        - Identification of preservatives used.
        - Any remarks, as needed.
        - Sampler's name or initials.

4. After samples are collected, identified and preserved in the field, they are maintained under Chain-of-Custody procedures as described in Chapter 5.0.

5. When preparing a cooler for shipment, the samples should be inventoried and logged on the Chain-of-Custody form. As each sample bottle is logged on the Chain-of-Custody form, it should be wrapped with protective material (e.g. bubble wrap matting or plastic gridding) to prevent breakage. Each sample bottle should be packaged in an upright condition. All sample bottle caps should be checked during this time and tightened if needed. Additional packaging material, such as bubble wrap or Styrofoam pellets, should be spread throughout the voids between the sample bottles.

6. Most samples require refrigeration as a minimum preservative. Cold packs or ice placed in heavy-duty ziplock-type bags should be distributed over the top

7. of the samples. Additional packaging materials should then be placed to fill the balance of the cooler or shipping container.

8. Place the complete Chain-of-Custody records in a ziplock-type plastic and place the bad on top of the contents within the cooler or shipping container. Retain a copy of the Chain-of-Custody record within the field records.

9. Close the top or lid of the cooler or shipping container and with another person rotate/shake the shipping container to verify that the contents are packed so that they do not move. Add additional packaging material if needed and re-close.

10. Place Chain-of-Custody type (signed and dated) at two different locations (front and back) on the cooler or shipping container lid and overlap with transparent packaging tape. Packaging tape should encircle each end of the cooler or shipping container at the hinges.

11. Sample shipment should occur via an overnight express service that can be guaranteed 24-hour delivery. Retain copies of all shipment records as provided by the shipper.

12. The documentation for support for proper packaging and shipment will include Chain-of-Custody records and shipper's records. All documentation will be retained in the project files.

9.0 SAMPLE CHAIN OF CUSTODY

1. All samples or objects that are collected at the Centex Dayton Canyon site will be accompanied by a Chain-of-Custody form:

    - Project name and number.
    - Laboratory destination.
    - Name of sampler.
    - Airbill (courier) number.
    - The sample number, location and description, date and time collected, sample type, and container type.
    - Any special instructions and/or sample hazards.
    - Signature of sampler in the designated blocks, indicating his/her company, date, and time.
    - The condition of the sample upon receipt will be completed and recorded by the analytical laboratory.

2. The following Chain-of-Custody procedures will be followed for all samples submitted to the laboratory for chemical or physical properties analysis:

- Each individual field sampler is responsible for the care and custody of samples he collects until the samples are properly transferred to the Design Contractor.
- The Design Contractor is personally responsible for the care and custody of the samples received until they are properly transferred to the next authorized person or facility.
- Sample labels will be completed for each sample using waterproof, indelible ink.
- All samples collected must be documented on a sample collection log form.
- A Chain-of-Custody form will be completed by the sampler for all samples or physical evidence collected.
- Each time responsibility for custody of a sample changes, the new sample custodian will sign and date the Chain-of-Custody form, and note the date and time that the change occurred.
- A copy of the Chain-of-Custody form shall be retained by the sampler.
- The courier bill number corresponding to the air bill used to ship the cooler shall be recorded in the space provided at the top of the Chain-of-Custody form.
- A copy of the courier airbill shall be retained as part of the final Chain-of-Custody documentation prepared by the laboratory.
- The laboratory manager will record the condition of the shipping container and sample containers upon receipt.
- The original Chain-of-Custody form will be returned from the laboratory as part of the final analytical report to the Project Coordinator. This record will be used to document sample custody transfer from the sampler to the laboratory and will become a permanent part of the project file.